

CLAIMS

1. A composition to produce impact-resistant thermoplastic materials of the type consisting in a block copolymer that comprises as monomers an alkadiene (conjugated diene) and a vinyl aromatic compound, characterized because, at least, one block of the vinyl aromatic compound in the copolymer is polydispersed, wherein that polydispersity of at least one block of the vinyl aromatic polymer is within the 1.01 to 4 interval.

2. A composition, in accordance with claim 1, further characterized in that the molecular weight of, at least, one block of the vinyl aromatic monomer is within the 5,000 g/mol to 420,000 g/mol interval.

3. A composition, in accordance with claim 2, further characterized in that the molecular weight of, at least, one block of the vinyl aromatic monomer is within the 30,000 g/mol to 120,000 g/mol interval.

4. A composition, in accordance with claim 1, further characterized in that the copolymer blocks are selected among linear or radial blocks, perfect or partially randomized blocks with the general formula $[B(B/S)S]_i Z$, where $i, j = 1, 2, 3, \dots$; Z = residues of the coupling agent or finishing agent; S = vinyl aromatic monomer; and B = alkadiene.

5. A composition, in accordance with claim 4, further characterized in that the correspondent part of alkadiene may be totally or partially hydrogenated.

6. A composition, in accordance with claim 5, further characterized in that the B/S ratio is between 10/90 and 90/10.

7. A composition, in accordance with claim 6, further characterized in that the B/S ratio is between 20/80 and 80/20.

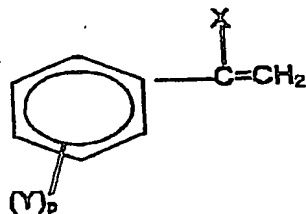
8. A composition, in accordance with claim 7, further characterized in that the B/S ratio is between 70/30 and 60/40.

9. A composition, in accordance with claim 1, further characterized in that the molecular weight of block copolymer is within the 100,000 g/mol to 450,000 g/mol interval.

10. A composition, in accordance with claim 1, further characterized in that the vinyl aromatic monomer is an ethylenic unsaturated compound with formula (I)

AMENDED SHEET

BEST AVAILABLE COPY



(I)

in which X represents one hydrogen or one alkyl radical with C₁-C₄; p is zero or a whole number between 1 and 5; and Y represents a halogen or an alkyl radical with C₁-C₄.

11. A composition, in accordance with claim 10, further characterized in that the vinyl aromatic monomer is selected among vinyl toluene, styrene, methylstyrene^o, mono-, di-, tri-, tetra- and pentachlorostyrene and the corresponding alpha-methylstyrene, alkylated styrenes in the core and the corresponding alpha-methylstyrenes; ortho- and para-methylstyrenes, ortho- and para-ethylstyrenes, ortho- and para-methyl-alpha-styrenes, and mixtures or combinations among them or with other copolymerizable monomers.

12. A composition in accordance with claim 11, further characterized in that the monomers copolymerizable with the vinyl aromatic monomer are selected among acrylic monomers, methacrylic monomers, acrylonitrile and maleic anhydride.

13. A composition, in accordance with claim 1, further characterized in that the alkadiene or conjugated diene has 4 to 8 carbon atoms in its molecule.

14. A composition, in accordance with claim 13, further characterized in that the alkadiene or conjugated diene is selected among 1,3-butadiene, isoprene, 2,3-dimethyl-1,3-butadiene, piperylene and mixtures among them.

15. A composition, in accordance with claim 1, further characterized in that the alkadiene or conjugated diene is 1,3-butadiene.

16. A composition, in accordance with claim 1, further characterized in that includes other coadjuvant agents selected among mineral oil, molecular weight regulators, antioxidants, pigments, charges and thermal stabilizers.

17. An impact-resistant thermoplastic composition of the type that comprises a vinyl aromatic monomer and an impact-modifier material consisting in a block copolymer

^o Vinyl toluene and methylstyrene are synonyms; they have the same CAS No. 25013-15-4.

PCT02/835

PCT/MX02/00105

16

that comprises as monomers an alkadiene (conjugated diene) and a vinyl aromatic compound, being such composition characterized in that comprises:

- A) 3 % to 50 % in weight of impact-modifier material, such material having, at least, one block of polydisperse vinyl aromatic compound.
- B) 97 % to 50 % in weight of the vinyl aromatic monomer.

18. A thermoplastic composition, in accordance with claim 17, further characterized in that the polydispersity of, at least, one block of the vinyl aromatic monomer of the impact-modifier material is within the 1.01 to 4 interval.

19. A thermoplastic composition, in accordance with claim 17, further characterized in that the molecular weight of, at least, one block of the vinyl aromatic monomer of the impact-modifier material is within the 5,000 g/mol to 420,000 g/mol interval.

20. A thermoplastic composition, in accordance with claim 19, further characterized in that the molecular weight of, at least, one block of the vinyl aromatic monomer of the impact-modifier material is within the 30,000 g/mol to 120,000 g/mol interval.

21. A thermoplastic composition, in accordance with claim 17, further characterized in that the copolymer blocks are selected among linear or radial blocks, perfect or partially randomized blocks with the general formula $[B(B/S)S]_{ij} - Z$, where $i, j = 1, 2, 3, \dots$; Z = residues of the coupling agent or finishing agent; S = vinyl aromatic monomer, and B = alkadiene.

22. A composition, in accordance with claim 21, further characterized in that the part corresponding to the alkadiene may be totally or partially hydrogenated.

23. A composition, in accordance with claim 21, further characterized in that B/S ratio is between 10/90 and 90/10.

24. A composition, in accordance with claim 23, further characterized in that B/S ratio is between 20/80 and 80/20.

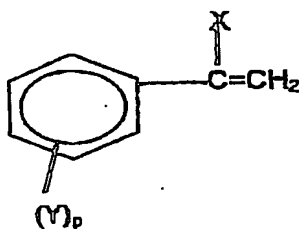
25. A composition, in accordance with claim 24, further characterized in that B/S ratio is between 70/30 and 60/40.

26. A thermoplastic composition, in accordance with claim 17, further characterized in that the molecular weight of block copolymer is within the 100,000 g/mol to 450,000 g/mol interval.

27. A thermoplastic composition, in accordance with claim 17, further characterized in that the vinyl aromatic monomer is an ethylenic unsaturated compound with formula (I)

AMENDED SHEET

BEST AVAILABLE COPY



(I)

in which X represents one hydrogen or one alkyl radical with C_1-C_4 ; p is zero or a whole number between 1 and 5; and Y represents a halogen or an alkyl radical with C_1-C_4 .

28. A composition, in accordance with claim 27, further characterized in that the vinyl aromatic monomer is selected among vinyl toluene, styrene, methylstyrene^o, mono-, di-, tri-, tetra- and pentachlorostyrene and the corresponding alpha-methylstyrene, alkylated styrenes in the core and the corresponding alpha-methylstyrenes; ortho- and para-methylstyrenes, ortho- and para-ethylstyrenes, ortho- and para-methyl-alpha-styrenes, and mixtures or combinations among them or with other copolymerizable monomers.

29. A composition in accordance with claim 28, further characterized in that the monomers copolymerizable with the vinyl aromatic monomer are selected among acrylic monomers, metacrylic, acrylonitrile and maleic anhydride.

30. A thermoplastic composition, in accordance with claim 17, further characterized in that the alkadiene or conjugated diene has 4 to 8 carbon atoms in its molecule.

31. A composition, in accordance with claim 30, further characterized in that the alkadiene or conjugated diene is selected among 1,3-butadiene, isoprene, 2,3-dimethyl-1,3-butadiene, piperylene and mixtures among them.

32. A thermoplastic composition, in accordance with claim 31, further characterized in that the alkadiene or conjugated diene is 1,3-butadiene.

33. A thermoplastic composition, in accordance with claim 17, further characterized in that includes other coadjuvant agents selected among mineral oil, molecular weight regulators, antioxidants, pigments, charges and thermal stabilizers.

^o Vinyl toluene and methylstyrene are synonyms; they have the same CAS No. 25013-15-4.

AMENDED SHEET

BEST AVAILABLE COPY

Empf.nr.:947 P.012

04-05-2005